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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,139	10/30/2003	Satyavolu S. Papa Rao	TI-36382	9759
23494	7590	01/31/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			DANG, PHUC T	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 01/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/697,139	Applicant(s) PAPA RAO ET AL.	
	Examiner PHUC T DANG	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Pre-Amendment filed December 8, 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-15 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6 and 8 is/are rejected.
- 7) ☒ Claim(s) 3 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 September 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Preliminary Amendment

1. Preliminary Amendment filed on December 8, 2003 has been acknowledged.

In Preliminary Amendment, Applicants renumbered claims 11-16 to claims 10-15 as the number 10 was inadvertently omitted.

Claims 1-15 are currently pending in the application.

Oath/Declaration

2. The oath/declaration filed on October 30, 2003 is acceptable.

Drawings

3. The drawings filed on September 27, 2004 is objected to because of the followings:

The drawings of Figures 1 and 2A-2E are objected to as failing to comply with 37CFR 1.84(p)(5) because they do not include the following reference sign(s) "106 decoupling capacitor" and "134 standard metal capacitor". Correction is required.

Specification

4. On page 8, line 1, the term "... top electrode 114..." should change to -- ... top electrode 112... --.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was

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commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-2, 4-6 and 8 are rejected under 35 U.S.C. 102 (e) as being anticipated by Block et al., hereinafter "Block" (US 2004/0145855 A1).

Regarding claim 1, Block discloses a method of fabricating an integrated circuit, comprising the steps of:

providing a semiconductor body having a top metal interconnect level (102, Fig. 1) formed thereon, the top metal interconnect level (102, Fig. 1) having a first and a second metal interconnect line (102, Fig. 1);

depositing a material (107, Fig. 1) over the top metal interconnect level (102, Fig. 1);

patterning and etching the material (107, Fig. 1) to expose a portion of the top metal interconnect level (102; and

forming a capacitor (100, Fig. 1) on the exposed portion of the top metal interconnect level (102, Fig. 1), wherein the first metal interconnect line (102, Fig. 1) is protected by the material during the step of forming the capacitor.

Regarding claim 2, Block discloses, wherein the step of forming the capacitor comprises the steps of:

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depositing a bottom electrode material (104, Fig. 2) on the exposed portion of the top metal interconnect level;

forming a capacitor dielectric (105, Fig. 2) over the bottom electrode material;

depositing a top electrode material (106, Fig. 2) over the capacitor dielectric, and

patterning and etching the top electrode material (106, Fig. 2), the capacitor dielectric (105, Fig. 2), and the bottom electrode material (104, Fig. 2) to form the capacitor.

Regarding claim 4, Block discloses wherein the bottom electrode material and the top electrode material each comprise TaN [page 3 [0046]].

Regarding claim 5, Block discloses wherein the bottom electrode material and the top electrode material each comprise one or more layers of material selected from the group consisting of TaN, TiN, Ir, Ru, and Ta [page 3 [0047]].

Regarding claim 6, Block discloses wherein the capacitor dielectric layer comprises tantalum-oxide [page 5 [0061]].

Regarding claim 8, Block discloses wherein the first and second metal interconnect lines comprise copper [page 1[0006]].

Allowable Subject Matter

6. Claims 9-15 would be allowed.

The following is a statement of reason for the indication of allowable subject matter:

Claims 9-15 are considered allowable since the prior art of record and the considered pertinent to the applicant's disclosure does not teach or suggest the claimed invention having a etch stop layer over the protect layer; a protective overcoat over the etchstop layer; and an

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aluminum cap layer located partially over the protective overcoat and electrically connecting a top electrode of the decoupling capacitor to the second copper interconnect line.

Claims 3 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claim.

None of the Prior Art made of record does not disclose further comprising the steps of forming a protective overcoat over the top electrode and the top metal interconnect level, forming a cap partially over the protective overcoat, the cap electrically connecting the top electrode material and the second metal interconnect line as cited in claim 3 and wherein the capacitor dielectric layer comprises hafnium-oxide or silicon nitride as cited in claim 7.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuc T. Dang whose telephone number is (571) 272-1776. The examiner can normally be reached on 8:00 am-5:00 pm.

8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and After Final communications.

9. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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Phuc T. Dang

PD 

Primary Examiner

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